The Health Effects of Downsizing in the Nuclear Industry

Idaho National Engineering and Environmental Laboratory (INEEL)

Executive Summary

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Organizational restructuring within the defense industry prompts research on health effects.

The dissolution of the Soviet Union and the ending of the Cold War in 1992 resulted in marked shifts in United States military strategy and budgets. Consequently, Congress passed Section 3161 of the National Defense Authorization Act for Fiscal Year 1993 outlining an approach to workforce layoffs in the nuclear weapons industry. Since then, there have been 46,000 layoffs of contractor employees at Department of Energy sites. More than 14,000 employees were downsized from the five study sites between September 1991 and September 1998 through voluntary and involuntary layoff events. In 1999, employment at the five sites was from nine to sixty nine percent lower than the highest employment level during the 1990's. The downsizing rates for each of the sites, including overall downsizing and the extent to which layoffs were of a voluntary nature, are presented below in Figure 1.

**Figure 1: Rates of Downsizing and Voluntary Layoffs
Ranges for Level 3s, by Site**
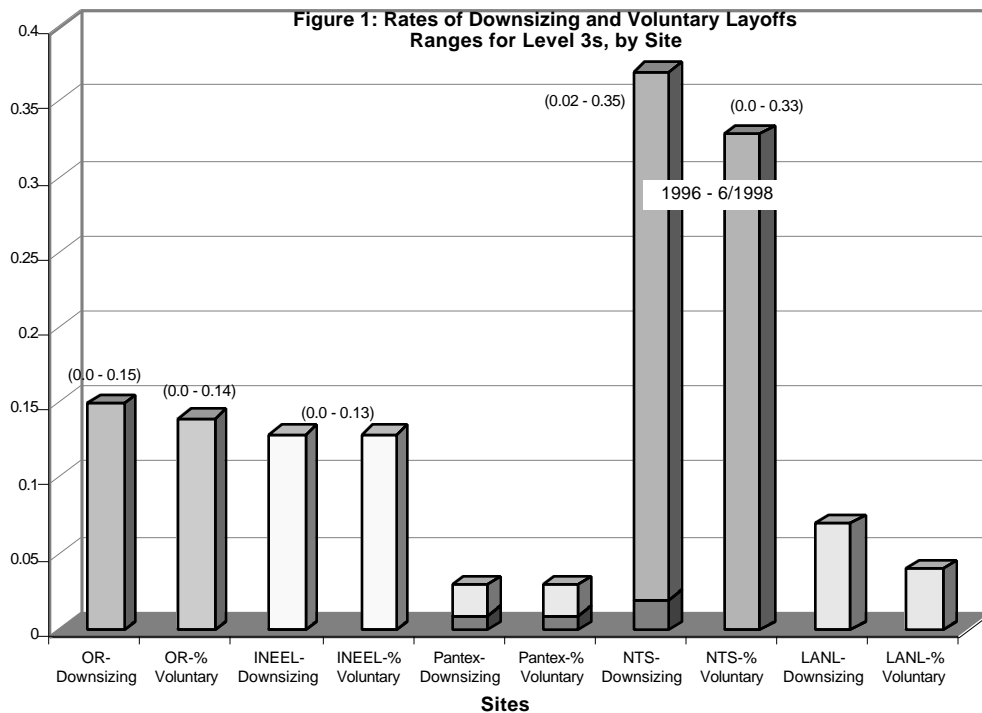
To better understand the impact of such downsizing and other organizational changes on both the remaining workforce and those who lost their jobs, the U.S. Department of Energy (DOE) and the Centers for Disease Control (CDC) solicited research proposals.

Boston University School of Public Health, with funding from the National Institute of Occupational Safety and Health (NIOSH), was selected to study and recommend ways to mitigate the impacts of workforce reductions on individual and organizational health.

This study required enormous cooperation. Our biggest thanks are to the nearly 6,000 employees who participated in focus groups or interviews and completed surveys, and to those supervisors who helped make that possible. This report was peer reviewed by two experts in the field of workplace stress and psychosocial research.

Boston University School of Public Health study is most far reaching of its kind.

Our research, covering the period from 1991 through June 1998, is the largest of its kind--in both scale and scope--to investigate the health and organizational effects of

workplace restructuring. Marrying the disciplines of public health, organizational psychology and organizational management, we used several methodologies and designed a multi-level research model to best capture the complexity and variety of relevant data.

In our survey, which was only one piece of the data collection, we sampled 10,645 employees from our five study sites (or 43% of all eligible employees at those sites). We received an overall response of 55% and, at the Idaho National Engineering and Environmental Laboratory (INEEL), 71% or 1,681 employees completed the survey. Figure 2 compares response rates by site.

Figure 2: Survey Response by Site
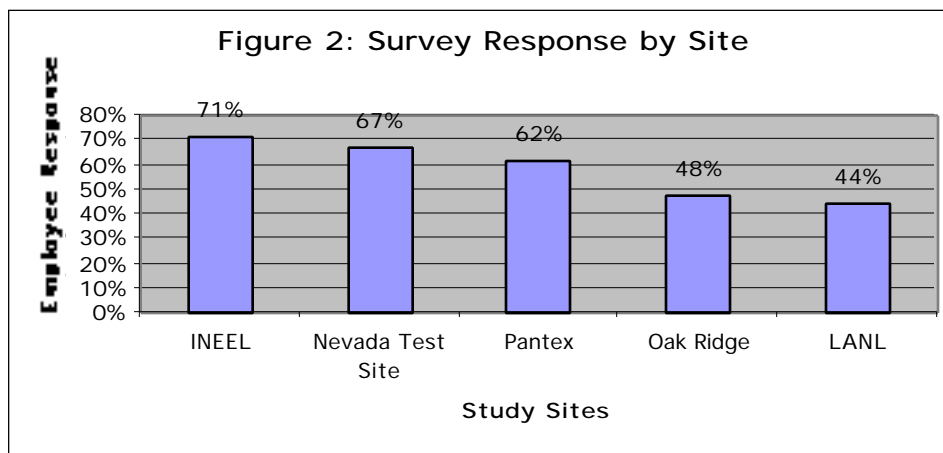
Globally, downsizing and organizational restructuring have become common management tools, used to improve operational and fiscal efficiency. However, little is known, about the effects of these tools on employee health or organizational effectiveness. Therefore, the knowledge sought through this research is important for employees, unions, and other employee organizations, contractors and federal entities managing organizational change in DOE facilities, as well as for those in other industries.

We identified and investigated four key issues in downsizing, reorganization and health.

1. Downsizing will have a negative effect on individual health and workplace functioning (i.e., employee morale, work performance and job security).
2. Employees are less likely to experience negative health effects and organizations are more apt to function normally the fairer the downsizing process and the fewer direct elements of downsizing the employee experiences.

3. During periods of organizational change, one's work and work environment, including job strain[*], organizational style, co-worker and supervisor support, and workplace safety will affect both individual health and workplace functioning.

4. Workplace factors including job strain, organizational climate, and the employee's perception of the fairness of the downsizing process can moderate the impact of downsizing on health and organizational outcomes.

Findings at INEEL Demonstrate Need to Develop Interventions for Improved Employee Health.

The Idaho National Engineering and Environmental Laboratory (INEEL) has experienced extensive organizational change including contractor consolidation, contract changes and downsizing since 1993 as seen in Figure 2 We chose INEEL as a study site because it is large, located in a small fairly remote city and the Department of Energy is the major regional employer.


• **Definitions of terms**

Job strain measures both the "demand" one experiences at work (physical and psychological) and the "control" an employee has over work tasks, where job control refers to the ability to structure your work, feel challenged and use your skills and training. Job strain is measured using three scales: the job demands scale, the decision authority scale and the skill discretion scale.

Organizational style refers to managerial and leadership approaches, with particular attention to how relationships and problems are handled. We looked at the company's organizational style using four scales on: 1) handling conflict, 2) the relationship with the DOE, 3) how management communicates with employees, and 4) workplace violence.

Organizational climate is used here as an umbrella term for work environment issues. We include the components of organizational style listed above (four scales) as well as co-worker and supervisor support and workplace health and safety (three scales measuring general safety, toxic exposure and exposure to noise).

Figure 2: Timeline of INEEL Downsizing and Restructuring Events
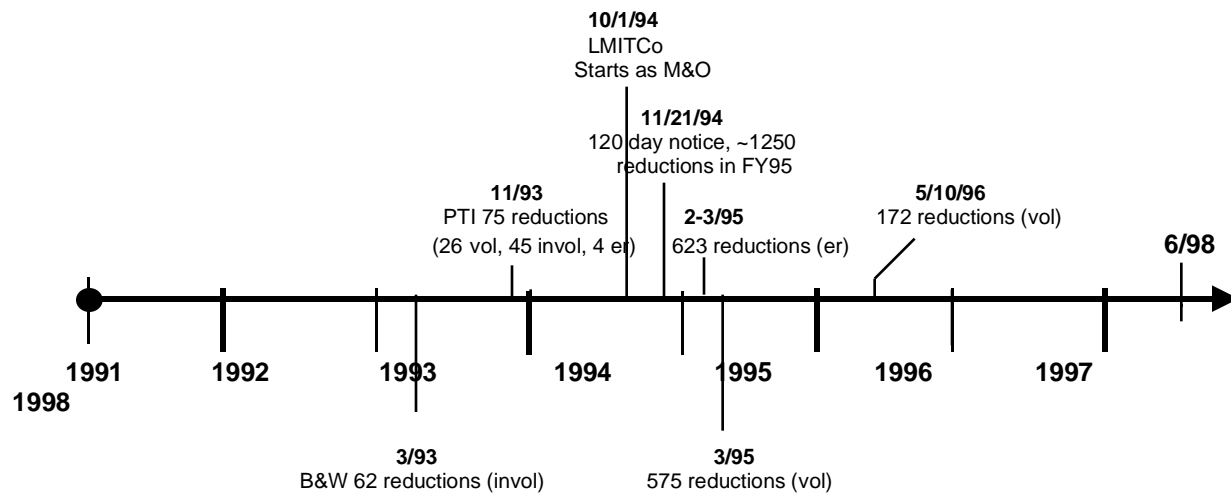
Work force Reduction Type
vol= voluntary incentive, non early retirement
er= early retirement
invol= involuntary

Our research yielded the following five site-specific findings at INEEL.

1. Employees who perceived that downsizing was implemented with clearly explained reasons, worker input, open respectful, truthful and unbiased communication with employees, and consistent and fair rules experienced fewer negative health effects.

   - A process perceived as just and fair was associated with fewer reported medical symptoms and conditions.
   - Greater fairness was associated with better mental health status (MCS), fewer survivor syndrome symptoms and less perceived stress.
   - The more fair the downsizing, the less job insecurity was expressed and the higher the reported morale.

2. Employees who reported more direct experiences of the downsizing performed worse on five of the nine outcome measures.

   - A higher score on the downsizing experiences index was associated with more medical symptoms and conditions and with a lower overall health score (PCS).
   - These employees had lower mental health scores (MCS).
   - The more downsizing elements experienced, the greater the job insecurity.

3. Employees who experienced greater job strain reported an increase in adverse individual and organizational functioning outcomes.

   - Workers with higher job strain reported a greater number of medical symptoms and medical conditions.
   - Higher job strain was associated with poorer reported mental health status, more survivor syndrome symptoms and greater perceived stress.
   - Morale and job security were lower for employees who reported high strain and they reported more instances of poor work performance.

4. Employees who felt that INEEL managers and employees effectively resolve conflicts at the site, performed better on seven of nine study outcomes.

   - Effective conflict resolution was predictive of fewer medical symptoms.
   - A workplace that resolves conflicts is statistically association with employees who have better mental health, less stress and fewer survivor syndrome symptoms.
   - These employees also report higher employee morale, better work performance and greater job security.

5. Employees who experienced threats or acts of violence, harassment or discriminatory treatment have worse health outcomes.

   - Employees who report more experiences of violence, harassment or discriminatory treatment report worse physical health (on all three measures).
   - INEEL employees who experienced more instances of violence or harassment reported worse mental health.
   - More violent or harassing experiences was statistically associated with greater job insecurity and more instances of poor work performance.

6. Employees at INEEL expressed some consistent concerns in employee discussion groups, interviews and comments written on the surveys. We heard that:

   - the relationships between upper management (which had an increased workload and pressure) and employees had become strained and was highlighted by decreased trust and communication;
   - there was dissatisfaction with the matrix system as employees believed that it hampered effective employee/supervisor relationships;
   - there was a perceived difference between site and town employees with workers stating that it was a disadvantage to be working at the site;
   - organizational changes including downsizing, budget cuts, and increased workload were believed to present great challenges to a positive safety culture because employees preoccupied with job concerns were more likely to make mistakes and compromise safety;

- there was continued job insecurity resulting from lack of information about future changes as well as the lack of good external job opportunities.

INEEL findings are similar to findings at four other study sites.

At all five sites, our survey, focus group and interview data show the importance of a fair and just downsizing process on employee health. The more elements of downsizing that individual employees experience, the more likely they are to suffer negative effects, particularly related to medical symptoms, overall mental health and job security. High job strain had negative effects on employee health and organizational functioning at all of the study sites, each in its own stage of downsizing. INEEL was the site at which both job stain and fairness were associated with the most outcomes.

While the experience of violence or harassment predicted negative outcomes at three sites, including INEEL, it did not emerge as important at two others. The effective resolution of conflict emerged as an important theme at INEEL but none of the other sites.

Study employs various methods to understand the complexity of downsizing and organizational change.

We used multiple approaches to collect and compare information about the extent of downsizing, employees' perceptions of the downsizing, workplace safety and other organizational issues. Through our interviews with key individuals, focus group discussions and work-site observations, we were able to glean characteristics and themes within the workplace as perceived by the employees themselves. This qualitative data revealed aspects of employee culture and organizational climate that could not be obtained with other research techniques.

A central source of data was the responses to the *Boston University Workplace Survey.* The survey was sent to a random selection of 2,368 Lockheed Martin Idaho Technology Company (LMITCo) employees. We received a response of 71% from workers at INEEL. This survey, based on our review of relevant literature and knowledge gained from interviews and focus group discussion, was pilot tested at four sites, reviewed by NIOSH institutional boards and then revised.

We also reviewed archival records (including sick time data, overtime usage, downsizing data and accident and illness data, medical services utilization, etc.) for their potential use in this research.

Researchers maintained a high level of communication with employees and their communities throughout the study.

Throughout our research, we maintained the highest levels of communication with employees and members of their communities. We sponsored town and community meetings to relay information about and receive feedback on our study. We obtained informed consent from employees involved in any interview, focus group or who completed the employee survey. At various stages of the research we made available information about the study and research updates for publication in site and local media. Additionally, we established a study e-mail account and posted information on the World Wide Web. We will be presenting our results at each site and will make available written materials at all sites and by request from researchers and on the Web.

Researchers recommend interventions that target many levels of the organization and include further research.

Our findings point to many ways to mitigate negative impacts on employee health and workplace functioning. In order to be most effective, an intervention design should address the following three organizational levels and should feature a variety of approaches. We provide here only a few examples within each category. Our complete list of recommendations can be found in the final report for INEEL: The Health Effects of Downsizing in the Nuclear Industry: Findings at the Idaho National Engineering and Environemntal Laboratory (INEEL).

At the policy and structural level, interventions should include, for example, programs and policies to address: any incidence of workplace harassment and violence; flexible work schedules that respond to employee concerns about workload, work demand and poor work-home balance; and preparation and training of managers who must plan or implement a downsizing or restructuring event.

Interventions that address procedures and group functioning should include, for instance: training for managers on effective supervision and communication; employee training on workplace diversity; and programs that encourage employees to respond to workplace change openly.

Individual level interventions should include, for example: sessions on exercise and stress reduction; collaboration with employees to redesign jobs or work stations; and information that use of the Employee Assistance Program will not detrimentally affect one's career.